

revision, and investigations of the cytological phenomena involved are especially needed. PASCHER's observations were microscopic to be sure, but he has apparently attempted no cytological observations at all.—R. THIESSEN.

Sigillarian stems.—Owing to the rarity of sigillarian stems showing structure the description of new specimens is of particular interest to paleobotanists. KIDSTON¹⁹ has given a well-illustrated and adequate description of *Sigillaria elegans*, which differs from the historic *S. Menardi* in that the primary wood of the former is continuous instead of broken up into bundles. The protoxylem is external to the metaxylem, and both are composed of scalariform tracheids. The secondary wood is about equal in thickness to the primary, and shows medullary rays which are mostly one cell thick and one to nine cells high. The outer margin of the primary wood is crenate, and from the furrows arise the leaf traces, of which there are about twenty-eight in a cross section; these do not seem to possess any secondary wood. As is usual in sigillarian stems the pith, phloem, and inner cortex have perished, and the outer cortex contains a broad zone of periderm. *S. elegans*, with a continuous ring of primary xylem, *S. spinulosa*, with a mixture of continuous and discrete xylem, and *S. Menardi*, with separate bundles, form a good series, and judging from the scanty data available it seems that this series represents a sequence in time. The features of *S. elegans* support the view that the genus sprung from forms more like *Lepidodendron*.—M. A. CHRYSLER.

Mycoplasmic propagation of grain rust.—ERIKSSON has published another instalment of his studies on the demonstration of the propagation of grain rust by means of mycoplasma, this time dealing with *Puccinia graminis*.²⁰ Four means are recognized by which the uredo stage of the rust may possibly arise in spring time in winter wheat: (1) from spores of the barberry aecidium, which in turn arose from the resting teleutospores that had remained dormant over winter; (2) direct infection of the wheat plant from the resting teleutospores (homoeicism); (3) uredo infection from mycelium remaining alive in the wheat plant over winter; and (4) from endogenous germs of disease (mycoplasma) which pass the winter in a resting condition in the live wheat plant. He marshals a large array of data, drawn from his own observations and experiments and from a wide range of literature, to show that the first method, although it exists, is by no means universal, that the second is highly probable, that the third never occurs in northern regions, if anywhere, and that the fourth is the most common method everywhere. Although the conclusions of the author will not be accepted by most investigators of this difficult problem, yet the array of data is interesting. Two clearly drawn

¹⁹ KIDSTON, ROBERT, On the internal structure of *Sigillaria elegans* of Brongniart's *Histoire des végétaux fossiles*. Trans. Royal Soc. Edinburgh 41:533-550. pls. 1-3. 1905.

²⁰ ERIKSSON, JAKOB, Ueber das vegetative Leben der Getreiderostpilze IV: *Puccinia graminis* Pers. in der heranwachsenden Getreidepflanze. Kungl. Sv. Vet.-Akad. Handl. 39⁵:1-41. pls. 1, 2. 1905.